1861MNRAS..22...39C

Notwithstanding that the heat of the Sun was so great as to make a shield necessary for the exposed part of my person (though I was generally well protected by a verandah), yet the image was, with occasional slight disturbances, as sharp as can be conceived, and afforded a striking contrast to all I have seen before.

I scrutinised the planet well throughout its transit, but could not be sure of any peculiarity. I repeatedly *fancied* it a little elliptical, but I do not believe in the reality of the appearance.

The times are given in Stierna mean time; they were noted with a duplex watch, compared with a standard mean time clock, accurately corrected and rated by sextant observations.

At $22^{h}\ 15^{m}\ 57^{s}\cdot 1$ the planet was estimated to be just its own diameter from the Sun's limb.

At $22^{h}\ 16^{m}\ 13^{s}\cdot 5$ it was clearly within one diameter.

At $22^{h}\ 18^{m}\ 5^{s}\cdot 9$, first contact. Shortly after, the planet seemed momentarily drawn out towards the limb, pear-like.

At $22^{h}\ 18^{m}\ 53^{s}\cdot 5$ the Sun's limb bisected the planet. No distortion whatever. Shortly afterwards I had a momentary impression of the lengthening out of the diameter which was a tangent to the Sun's limb, or which had just passed it.

At $22^{h}\ 20^{m}\ 21^{s}\cdot 5$, last contact, *i.e.* the first moment that I was sure that the planet was no more to be seen.

It has rarely been my lot to observe an astronomical phenomenon with circumstances so favourable and pleasant.

I have much pleasure in stating that I have erected the 4-foot equatoreal telescope on a very excellent site, across the Quarantine Harbour from Valetta, and nearly north of it, within a short distance of Fort Tigné.

A boundary wall, inclosing an area twenty yards square, in the centre of which the telescope stands, and a sufficiently capacious laboratory adjacent, are on the point of completion. The observing tower is in process of erection, and I hope very shortly to commence operations.

Observations of the Transit of Mercury, November 11, 1861, *made at the Observatory, Durham.* By Prof. T. Chevallier.

The weather was very favourable, at Durham, for observing the transit of *Mercury* on the 11th of November. At sunrise the eastern part of the sky was almost cloudless, and continued so till the emersion of the planet. The Sun's limb, however, in consequence of his low altitude and the state of the atmosphere, was very undulating.

1861MNRAS..22...39C

Mercury was seen upon the Sun's disk immediately after sunrise, his appearance as a round black spot contrasting strongly with that of some ordinary spots on the Sun's surface.

The instruments used, in different rooms, were the Northumberland Equatoreal, of 7 feet 4 inches focal length and 5 inches aperture, and the Fraunhofer Equatoreal, of 8 feet 3 inches focal length and 6·5 inches aperture.

The internal and external contacts were observed as follows, in Durham sidereal time:—

	Northumberland Telescope. Prof. Chevallier.	Fraunhofer's Telescope. Mr. A. Marth.
	h m s	h m s
Internal contact ...	12 38 52·68	12 38 54·0
External contact ...	12 40 53·61	12 40 59·0

Each of these observations was difficult, in consequence of the undulations of the Sun's limb. An instant before the internal contact, the thin curved line of light between the planet and the Sun's limb seemed to break up, by the sudden filling up of the two cusps by a black space. This appearance was, no doubt, occasioned by the tremulous motion affecting the Sun's limb. The exact time of the external contact was rendered uncertain from the same cause.

The times, computed from Le Verrier's Tables by the formulæ given by Dr. Schjellerupp (*Astronomische Nachrichten*, No. 1286), are,

	Durham Sid. Time.
	h m s
Internal contact ...	12 38 55·12
External contact ...	12 41 10·60

Mr. Marth made the following observations of the difference of R.A. and declination of the Sun and planet, with a wire micrometer, each observation in R.A. being made on five wires, and five different measures having been taken of the difference of declination of *Mercury* and the Sun's northern limb:

Durham Sid. Time, Nov. 11.	Greenwich M.T.	Diff. of R.A. ☿ — ☉ corrected for Refraction and Proper Motion.	No. of Obs.	Corrected for Parallax.	Computed from Schjellerupp.	C—O.
h m s	h m s	s		s	s	s
11 58 22·9	20 38 49·5	−11·192	2	−11·308	−11·558	−0·25
12 5 8·0	45 33·4	−13·770	2	−13·883	−14·111	−0·23
28 16·7	21 8 38·4	−22·871	2	−22·971	−22·886	+ ·08

		Diff. of Decl. ☿ — ☉ N. Limb.	No. of Measures.	Corrected for Parallax.		
$12^{h}\,21^{m}\,5^{s}\cdot 4$	$21^{h}\,1^{m}\,28^{s}\cdot 2$	$-2'\,6''\cdot 96$	5	$-2'\,3''\cdot 45$	$-1'\,59''\cdot 07$	$+4''\cdot 38$

1861MNRAS..22...39C

Observations of the Transit of Mercury, November 11, 1861, *at and near Liverpool.*

(*Communicated by Mr. Hartnup.*)

Observed by Mr. Hartnup, at the Liverpool Observatory, with the Equatoreal Refractor, aperture reduced to 4 inches, power 288, parallel wire micrometer.

By mean of 6 measures, equatoreal diameter = $10''\cdot09$
By mean of 6 measures, polar diameter = $9\cdot72$

The tremor was great, but the observations were taken with great care.

Egress.

	h	m	s	
Interior contact......	21	19	14·40	G.M.T.
Exterior contact ...	21	21	25·74	

The time was taken from the sidereal clock, which was $3^{s}\cdot33$ fast. The fine line of light appeared broken at $12^{h}\,33^{m}\,9^{s}$, but it instantly united again, and between 9^{s} and 20^{s} it broke and united several times; after 20^{s} the separation remained permanent. I have taken $14^{s}\cdot5$ as the most probable time of interior contact. Contrary to expectation, the last contact was observed with less difficulty than the first; the separation of the planet from the Sun's limb was instantaneous, and may, I think, be depended on to one second of time.

Egress observed by John Joynson, Esq., at Waterloo, near Liverpool:—

	h	m	s	
Interior contact ...	21	19	14·5	G.M.T.
Exterior contact...	21	21	9·5	

Latitude 53° 28′ 24″ N. Longitude 3° 1′ 44″ W.

Observed with a refractor of 3½ inches aperture and 50 inches focal length. The time was taken from a chronometer, the error of which was obtained from the Liverpool Observatory.

Egress observed by Matthew Jee, Esq., at Edge Hill, Liverpool:—

	h	m	s	
Interior contact ...	21	20	0	G.M.T.
Exterior contact...	21	21	20	

Latitude 53° 24′ 27″ N. Longitude 11′ 49″·4 W.

1861MNRAS..22...39C

Observed with a Dollond's refractor, $2\frac{1}{8}$ inches aperture; power 80. The time was taken from the seconds clock in the office-window of the Magnetic Telegraph Company. This clock is controlled from the Liverpool Observatory.

The Transit of Mercury, November 11, 1861, *observed at Grantham.* By J. W. Jeans, Esq.

Lat. 52° 54′ 52″ N. Long. 0° 39′ 0″ W.

Morning fine, but rather hazy; a good many light clouds; wind moderate, and atmosphere very tremulous; vision at times good. The first observation I consider very fair, the last rather uncertain; telescope 5 feet focal length, achromatic, of 4 inches aperture, reduced to 2 inches; power 80. I was rather impressed with the idea that the figure of *Mercury* was not quite round, but slightly elongated, and that there was also a slight ashy light on his eastern limb. At best visions the outline of the planet was sharp, and the impression of ellipticity doubtful; no appearance of atmosphere; clock corrected by transit of δ *Leonis* the same morning, and by Fomalhaut and Markab the previous evening.

	h	m	s	
First break (pretty good)...	12	42	38·03	Apparent Local Sid. Time.
Last contact (middling) ...	12	44	44·03	

Grantham, December 5, 1851.

Observations of the Transit of Mercury, November 11, 1861. By Joseph Baxendell, Esq.

The following observations were made at Mr. Worthington's Observatory, the instrument used being the equatoreally-mounted achromatic of 5 inches aperture and 70 inches focal length. A power of 126 was first applied; but, owing to the unsteadiness of the atmosphere at so low an altitude, micrometrical measurements of the diameter of *Mercury* were found to be quite impracticable. Two measures of the planet's position on the Sun's disk were taken under a power of 68, but a light cirrous cloud was passing slowly over the Sun at the time, and the images were still very tremulous. The mean result, corrected for refraction and parallax, was as follows:—

At $21^{\mathrm{h}}\,4^{\mathrm{m}}\,10^{\mathrm{s}}\!\cdot\!2$ G.M.T. App. R.A. of *Mercury* = App. R.A. of Sun − $20^{\mathrm{s}}\!\cdot\!74$

App. N.P.D. of *Mercury* = App. N.P.D. of Sun − 14′ 14″·5